

SECTION 16095

ELECTRICAL DEMOLITION

LANL MASTER CONSTRUCTION SPECIFICATION

When editing to suit Project, author shall add job-specific requirements and delete only those portions that do not apply to the Project (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the Engineering Standards Manual (ESM) Electrical POC. Refer to http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#elec for the Engineering Standards Manual Personnel Link Index.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

Specification developed for ML-3 / ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

PART 1 GENERAL

1.1 SECTION INCLUDES

Edit the following articles to match Project requirements; delete articles that are not needed.

- A. Removal of existing electrical equipment, wiring, and conduit in areas to be remodeled; removal of designated construction; dismantling, cutting and alterations for completion of the Work.
- B. Disposal of materials.
- C. Storage of removed materials.
- D. Identification of utilities.
- E. Removal of salvaged items and delivery to LANL.
- F. Protection of items to remain [as scheduled at end of section] [as indicated on Drawings].
- G. Relocate existing equipment to accommodate construction.

1.2 LANL PERFORMED WORK

- A. None

1.3 SUBMITTALS

**Edit the following articles to match Project requirements; delete articles that are not needed.
Include submittals only to the extent required to assure quality.**

- A. Submit the following in accordance with [Section 01330 Submittal Procedures](#):
 - 1. Shop Drawings: Indicate [demolition] [and] [removal sequence and location of salvageable items]; location and construction of temporary work. Describe demolition removal procedures and schedule.
 - 2. Project Record Documents: Record actual locations of capped [utilities] [conduits and equipment abandoned in place,] [____], and [_____].

1.4 REGULATORY REQUIREMENTS

- A. Conform to requirements of the *National Electrical Code* (NEC), OSHA, and NFPA 70E – *Standard for Electrical Safety Requirements for Employee Workplaces*.
- B. Each person performing electrical demolition shall be a “qualified person” as defined by NFPA 70E and the NEC.
- C. The following publications form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Environmental Protection Agency (EPA).
40 CFR Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.

40 CFR Part 273, Standards for Universal Waste Management.
 - 2. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA)
29 CFR Part 1910.94 Subpart G, Occupational Health and Environmental Control.
 - 3. Department of Transportation (DOT):
49 CFR Part 178, Regulations for Shipping Container Specifications.

1.5 COORDINATION

Edit the following articles to match Project requirements; delete articles that are not needed.

- A. Conduct demolition to minimize interference with adjacent [and occupied] building areas.
- B. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.

C. Shut-down Periods:

1. Arrange timing of shut-down periods of in service panels with LANL Contract Administrator (CA) or University Technical Representative (UTR). Do not shut down any utility without prior written approval.
2. Keep shut-down period to minimum or use intermittent period as directed by CA or UTR.
3. Maintain life-safety systems in full operation in occupied facilities, or provide notice minimum 3 days in advance.

D. Identify salvage items in cooperation with CA or UTR.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; follow [Section 01630](#), Product Options and Substitutions.

2.2 MATERIALS AND EQUIPMENT

- A. Provide materials and equipment for patching and extending work as specified in the individual Sections.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Before work begins on the demolition or salvage of electrical equipment, wiring, or systems:
1. Inspect the site to identify any hazardous materials such as PCBs, asbestos, lead, mercury or other heavy metal, or toxic, flammable or explosive materials, or radioactive materials that may be handled, disturbed or removed. Typical locations of hazardous materials include:
 - a. Lead: Batteries in emergency lighting, exit signs, fire alarm panels, security systems; some circuit breakers.
 - b. PCBs: Transformers, capacitors, lighting ballasts.
 - c. Asbestos: Pipe insulation, electrical insulation.
 - d. Mercury: Fluorescent lamps, HID lamps, thermostats, silent switches, relays.
 - e. Radioactive materials: Self-luminous exit signs, smoke detectors.
 2. Verify whether or not PCB ballasts exist in light fixtures which will be removed or relocated. If PCB light fixture ballasts exist, then follow requirements in PCB BALLAST HANDLING AND DISPOSAL below.

3. Have the inspection results available at the worksite, including any drawings, plans or specifications, as appropriate, to show the locations of any hazardous substances.
 4. Ensure that any hazardous materials found are safely contained or removed.
 5. During demolition work, if hazardous materials are discovered that were not identified in the initial inspection required above, stop work in the area and notify the CA or UTR. Do not resume work in the area until directed by the CA.
- B. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.
 - C. Verify termination points and lockout-tagout device locations for services, circuits, and systems to be disconnected or removed.
 - D. Demolition Drawings are based on casual field observation and/or existing record documents. Report discrepancies to the CA or UTR before disturbing existing installation.
 - E. Beginning of demolition work means Contractor accepts existing conditions.

3.2 PREPARATION

Edit the following articles to match Project requirements; delete articles that are not needed.

- A. Protect existing materials, appurtenances and equipment which are not to be demolished. Repair or replace existing materials, appurtenances and equipment, building exterior and interior, and landscaping altered or damaged during demolition work to match existing undisturbed conditions at no additional cost to LANL.
- B. Erect, and maintain temporary safeguards, [including warning signs and lights,] [barricades,] [and similar measures,] for protection of the public, LANL personnel, Contractor's employees, and existing improvements to remain.
- C. Provide temporary egress signage and emergency lighting to meet Life Safety Code requirements.
- D. Provide and maintain temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage, or wind damage occurs to structure or interior areas of existing building.
- E. Existing elevator [may][may not] be used for debris removal. [Protect elevator from damage. Damage due to work of this Section shall be the responsibility of the Contractor.]
- F. Use [a debris chute and] covered debris bins to [remove and] temporarily store materials [from the ____]. Location of [debris chute and] bins shall be approved by the CA or UTR.
- G. Maintain parking areas, driveways, exterior walkways, exit paths, and landscaping in a clean, undisturbed condition.

- H. Coordinate utility service outages with the LANL Utilities Group and the LANL Support Services Subcontractor.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
 - 2. All work on or near energized electrical utilities will be performed or supervised by the LANL Support Services Subcontractor.
 - 3. Protect utilities indicated to remain, from damage.
- I. Protect smoke alarms from dust intrusion.
- J. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits use qualified personnel in such operations. In particular, all security and safety systems must be maintained in operation at all times. This includes security and safety lighting.

Edit the following articles to match Project requirements; delete articles that are not needed.

- K. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from the CA or UTR and the LANL Utilities Group at least [48] [____] hours before partially or completely disabling system. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area.
- L. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Obtain permission from the CA or UTR and LANL Fire Marshal at least [48] [____] hours before partially or completely disabling system. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area.
- M. Existing Communication/Data System: Coordinate demolition work with the LANL Telecommunications Group. Maintain existing system in service until new system is complete and ready for service. In general the LANL Telecommunications Group will make switchovers and connections. Obtain permission from the CA or UTR and the LANL Telecommunications Group before removing telecommunications wiring or equipment.

Use the following article as many times to match special systems on Project; delete if not needed.

- N. Existing [_____] System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from the CA or UTR and [_____] at least [48] [____] hours before partially or completely disabling system. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

Edit the following articles to match Project requirements; delete articles that are not needed.

- A. Demolish, relocate, and extend existing electrical work to installations to accommodate new construction.
- B. Establish an electrically safe work condition in areas where electrical work is to be removed.
 - 1. Comply with LANL LIR 402-600-01 *Electrical Safety*. Perform work on energized equipment or circuits with qualified personnel as defined by the *National Electrical Code*.
 - 2. Comply with LANL LIR 402-860-01 *Lockout/Tagout for Personal Safety*. Disconnect or shut off service to areas where electrical work is to be removed. Properly lockout and tag disconnecting means. Verify zero-voltage before beginning demolition.
 - 3. Disconnect, remove, and cap designated utility lines within demolition areas. Mark locations of disconnected utilities. Identify utilities and indicate capping locations on Project Record Documents.
- C. Protect and retain power to existing active equipment that is to remain.
 - 1. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
 - 2. Install temporary wiring and connections to maintain existing systems in service during construction.
- D. Carefully remove equipment, materials, or fixtures which are to be reused. Store and protect to prevent damage.
 - 1. Disconnect, remove, or relocate existing electrical material and equipment interfering with new installation.
- E. Remove electrical fixtures, equipment, and related switches, outlets, conduit and wiring which are not part of final project.
 - 1. Remove items in an orderly and careful manner.
 - 2. Remove abandoned wiring to panelboard circuit breaker or source of supply.
 - 3. Remove exposed abandoned raceways, including abandoned raceways above accessible ceiling finishes. Cut raceways flush with walls and floors, seal openings, and patch surfaces.
 - 4. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.

5. Remove lamps from abandoned luminaires. Refer to LAMP HANDLING AND DISPOSAL below.
6. Disconnect and remove abandoned luminaires. Refer to PCB BALLAST HANDLING AND DISPOSAL below. Remove brackets, stems, hangers, and other accessories.
7. Remove abandoned cable tray systems.
8. Disconnect and remove abandoned panelboards and distribution equipment.
9. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
10. Remove exposed abandoned fasteners and supports, including abandoned components above accessible ceiling finishes. Cut embedded support elements flush with walls and floors.

Edit the following article to match Project requirements; delete article if not needed.

11. Disconnect and remove [_____].
 12. Cap abandoned empty conduit at both ends.
 13. If certain raceways and boxes are abandoned but not scheduled for removal, identify those items on the "As Built Drawings".
- F. Provide proper and permanent support to adjacent structure for all raceways, cable trays, luminaires, and equipment to remain.
- G. Repair adjacent construction and finishes damaged during demolition and extension work.
1. Patch and seal unused existing wall penetrations to match existing conditions and to restore fire rating.
- H. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. This includes the extension of the circuit from the last active device to the next device in the system to be activated.

Edit the following article to match Project requirements; delete if not needed.

1. Reconnect equipment being disturbed by renovation work and required for continued service to [_____ or] nearest available panel.
- I. Investigate and measure the nature and extent of unanticipated items that conflict with intended function or design. Submit written report with accurate detailed information to CA or UTR. While awaiting instructions from CA, rearrange selective demolition schedule as necessary to continue overall job progress without delay.
- J. Stop work and notify CA or UTR immediately if structure or other items to remain appear to be endangered. Do not resume work until directed by CA.

- K. Remove demolished materials as work progresses.

3.4 EXISTING PANELBOARDS

- A. Verify and identify loads served by circuits in existing panelboards affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new circuit breakers as required.
- B. Tag unused circuits as spare.
- C. Where existing circuits are indicated to be reused, use measuring devices to verify circuits feeding Project area are not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated directories where more than three circuits in a panelboard have been modified or rewired.

3.5 PCB BALLAST HANDLING AND DISPOSAL

- A. Generally, high power factor fluorescent light ballasts manufactured before 1978 and some HID ballasts contain PCB compounds in their capacitors. PCB ballast handling, storage, and disposal shall be in accordance with 40 CFR Part 761 and other applicable EPA PCB regulations.
- B. Inspect all ballasts in all light fixtures (which will become the property of the Contractor and will be removed from the project site as part of this project) and take the actions described below.
 - 1. All ballasts labeled as "NON-PCBs" or "NO PCBs" shall become the property of the Contractor. If the PCB content is not stated on the ballast label, handle the ballast as a PCB ballast.
 - 2. Remove PCB ballasts from the light fixtures and cut the wires off. However, before removal, carefully inspect PCB ballasts for leaks. If ballast appears to be leaking (evidenced by potting compound leaking out or by an oily film on the ballast surface) handle the ballast per 40 CFR Part 761 and other applicable EPA PCB regulations. Basically, this means the ballast is to be carefully removed from the fixture and placed in an approved drum. See paragraph below for the drum specifications. The person removing the ballast from the fixture shall wear neoprene protective gloves, eye protection, and protective clothing as necessary.
 - 3. If the fixture has also been contaminated, it will require cleaning to less than 10 micrograms/100 square centimeters contamination before disposal. This cleaning must be done by an approved PCB contractor and is not considered a part of this contract. Contact the CA or UTR to arrange cleanup by the LANL Support Services Subcontractor.
 - 4. Place the ballasts in US DOT approved type 17C or type 17H drums (barrels) furnished by the Contractor. 55 gallon and 30 gallon drums that meet the requirements of 49 CFR Part 178 are available from most drum suppliers. The quantity and size of the drums will be determined by the Contractor at the time of construction.

5. Place these barrels in storage with the cover that came with the barrels, in a location within a building, as designated by the CA or UTR. Do not place the barrels outside where they are exposed to weather.
 6. THESE BALLASTS ARE NOT TO BE REMOVED FROM THE WORK SITE BY THE CONTRACTOR. To do so would violate DOT hazardous waste regulations and may result in a fine to the Contractor.
 7. Label and mark the PCB storage drums with EPA approved PCB labels and the storage area with signs, marks and lines to meet state and federal regulations.
 8. Provide approved PCB absorbent materials to be stored immediately adjacent to the drum storage area. Do not place loose absorbent material in the drums.
 9. Provide to the CA or UTR, in written form, a total count of these ballasts (or their total weight by barrel) and where they are stored.
- C. When the ballast demolition is completed and all PCB ballasts are placed in drums ready to be picked up for disposal, notify the CA or UTR. The CA or UTR will make arrangements for the LANL Support Services Subcontractor to pick up the PCB ballasts.

3.6 LAMP HANDLING AND DISPOSAL

- A. All lamps (fluorescent, incandescent, and HID) contain mercury and/or lead (in the base) as well as other heavy metals and compounds which are regulated by the EPA during the disposal process. The handling, storage, and disposal of lamps shall be in accordance with 40 CFR Part 273.
- B. Handle lamps which have been removed from service for disposal as follows:
1. Very carefully remove all lamps (fluorescent, incandescent, and HID) from light fixtures before removal of the fixture from its mounted position. This is to reduce the likelihood that the lamp(s) will be broken. If the Contractor breaks more than 1% of the total lamps removed for the project, the Contractor will be charged the cost difference between disposal of broken lamps and disposal of unbroken lamps for all lamps broken in excess of 1% of the total lamps removed in the project.
 2. Provide containers large enough to fully conceal the removed lamps and appropriate for lamp transportation. Place removed lamps in containers and mark container with the number and type of lamps. Place containers in storage in a location on LANL property (this may be in another building) arranged by the CA or UTR. The Contractor shall label the area as "Hazardous Material Storage - Mercury".
 3. Provide to the CA or UTR, in written form, a count of all stored lamps by type at the completion of the project.
 4. The CA or UTR will make arrangements for the lamps to be picked up by the LANL Support Services Subcontractor.

3.7 CLEANING AND REPAIR

Edit the following articles to match Project requirements; delete articles that are not needed. Identify on the Drawings items to be cleaned or repaired.

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide approved closure plates for vacant positions.
- C. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts (if required) and broken electrical parts. Test for proper operation.

3.8 DISPOSITION OF MATERIAL AND EQUIPMENT

- A. Remove and protect items indicated [on Drawings] [in Schedule] to be salvaged and deliver in good condition to LANL at the location designated by the CA or UTR.
- B. Items of salvageable value may be removed as work progresses. Transport salvaged items from site as they are removed.
- C. Unless indicated otherwise, material removed under this Contract which is not to be salvaged or reused in the Project shall become the property of the Contractor.
- D. Unless indicated otherwise, immediately remove demolished material from site. Do not store or permit debris to accumulate at the site. Dispose of materials legally off site. Do not burn or bury materials on site.
- E. Upon completion, clean the entire area of demolition residue satisfactory for the continuation of the Work. Remove temporary work.

3.9 INSTALLATION RELOCATED EQUIPMENT

- A. Install relocated materials and equipment under the provisions of the applicable sections of these Specifications.

3.10 SCHEDULES

Edit the following articles to match Project requirements; delete articles that are not needed. Include schedule when known items are to be turned over to LANL, salvaged and reused in construction later, or are destined for other use. Identify on the Drawings items to be cleaned or repaired.

- A. Remove, store and protect the following materials and equipment:
 - 1. [_____].
 - 2. [_____].
 - 3. [_____].

B. Remove the following equipment and materials for retention by LANL. Deliver to location designated by the CA or UTR:

1. [_____].

2. [_____].

3. [_____].

C. LANL will remove the following material and equipment before start of demolition:

1. [_____].

2. [_____].

3. [_____].

D. Protect the following materials and equipment to remain in place during construction:

1. [_____].

2. [_____].

3. [_____].

END OF SECTION

Do not delete the following reference information.

FOR LANL USE ONLY

This project specification is based on LANL Master Construction Specification Section 16095 Rev. 0, dated April 13, 2004.